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The Vámoscsalád-Kavicsbánya Site (Vas County)

Preliminary Results of the Evaluation of the Lithic Assemblage

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Abstract: The archaeological artefacts of the Vámoscsalád-Kavicsbánya site were discovered, collected and preserved by István Marton and his brother, András Marton, mineral collectors from Mesterháza, in about 2015. The slight elevation on a terrace of the Répce River was mined for the M86 highway in 2012–2013. Apart from knapped stone tools, the main subject of our paper, several polished serpentinite and greenschist tools have been recovered from the site, which could be in use between the Neolithic and the end of the Bronze Age. Only a few potsherds indicated a settlement of the Transdanubian Linear Pottery culture (TLPC). Of the Copper Age, Lengyel III and Baden pottery fragments and a clay spatula are worth mentioning. Almost the entire Bronze Age is represented, the most exciting find being a rim fragment of a bowl, decorated with an encrusted geometric pattern on both sides, of the Somogyvár–Vinkovci culture.

Given the presumed mixed character of the knapped stone record of the Vámoscsalád-Kavicsbánya site (as the finds were not recovered from a closed stratigraphic context), we looked for possible cultural analogies and relationships, primarily those corresponding to the system of raw material–technology–typology. Although the pottery fragments of the TLPC recovered from the site are few and uncharacteristic, and the recovered finds may represent more than one phase, the knapped stone assemblage most likely represents the industry of the Middle Neolithic cultural unit, as suggested by raw material composition, technological features, type distribution and characteristics of the retouched tools. It is perhaps even possible that we are dealing with relatively old, if not the oldest TLP finds ever unearthed in the county.

Keywords: knapped tools, Neolithic, Mesolithic, Transdanubia, Transdanubian Linear Pottery culture

The site

Geological and geographical setting

The municipality of Vámoscsalád is located in the Répce-sík microregion, an area of 167 m asl and with 8.5 m/km^2 average relief. It is characterised by a uniform, sparsely dissected surface, interbedded with cryoturbation forms, alluvial cone gravel layers of varying thicknesses between 5 and 15 m, broad, flat, eroded ridges covered with gravel glacial till and old gravel gullies and eroded beds, pools, and valley torrents of the Répce River.[1]

The Vámoscsalád area is indicated as an Upper Pleistocene gravel, sandy gravel layer (fQpk3) on the relevant geological map of Hungary (L-33-21, L-33-22 Friedberg [Brennbergbánya], Kőszeg).

Sándor Jaskó described the surface elevation of the gravel layer along the Rába River.[2] He also provided data for Répcelak, near Vámoscsalád, where the relative thickness of the left-bank (Upper and Middle Pleistocene) gravel layer is 3 m, while that on the right bank (Lower Pleistocene) is 10 m.

Discovery of the site

The archaeological finds of Vámoscsalád–Kavicsbánya were discovered, collected and preserved by mineral collectors István Marton[3] and his brother, András,[4] from Mesterháza, in about 2015 (Fig. 1). We were informed of the discovery in March 2019 and studied the site and the artefacts on several times. The finders also informed us that the slight elevation of the terrace of the Répce River, where the site is situated, was mined away for the M86 motorway in 2012–2013. During our research, it became clear that the archaeologists of the Savaria Museum in Szombathely, who were carrying out preventive excavations in the affected area at the time, noted the destruction of the site (not listed in the national site register) but were unable to take any meaningful action to save and study its record.

The finds

Pottery and other finds

The known finds mark a direction for future research. The Marton brothers' collection contains several serpentinite and greenschist (Felsőcsatár-type)[5] polished chisels/axes (Fig. 2; Fig. 3), which could be in use anytime between the Neolithic and the end of the Bronze Age. A serpentinite axe fragment cannot be dated more precisely, nor are the several saddle querns and handstones. Only a few potsherds indicate a settlement of the TLPC. Some Lengyel III and Baden pottery fragments and a clay spatula are worth mentioning from the Copper Age record. Almost the entire Bronze Age is represented in the assemblage; the most exciting find is a rim fragment of a bowl, decorated with an encrusted geometric pattern on both sides, of the Somogyvár–Vinkovci culture (Fig. 4). Besides, the collection also included some Urnfield Culture finds. The Roman Period is represented by the base fragment of a *terra sigillata* vessel, a *tegula* fragment, and sherds of other pottery ves-

1 Dövényi 2010, 373–377.

2 Jaskó 1995, 229, Tab. II.

3 9 Zrínyi Street, Mesterháza 9662, Hungary.

4 13 Petőfi Street, Mesterháza 9662, Hungary.

5 Kuti et al. 2007; Főzy 2012.

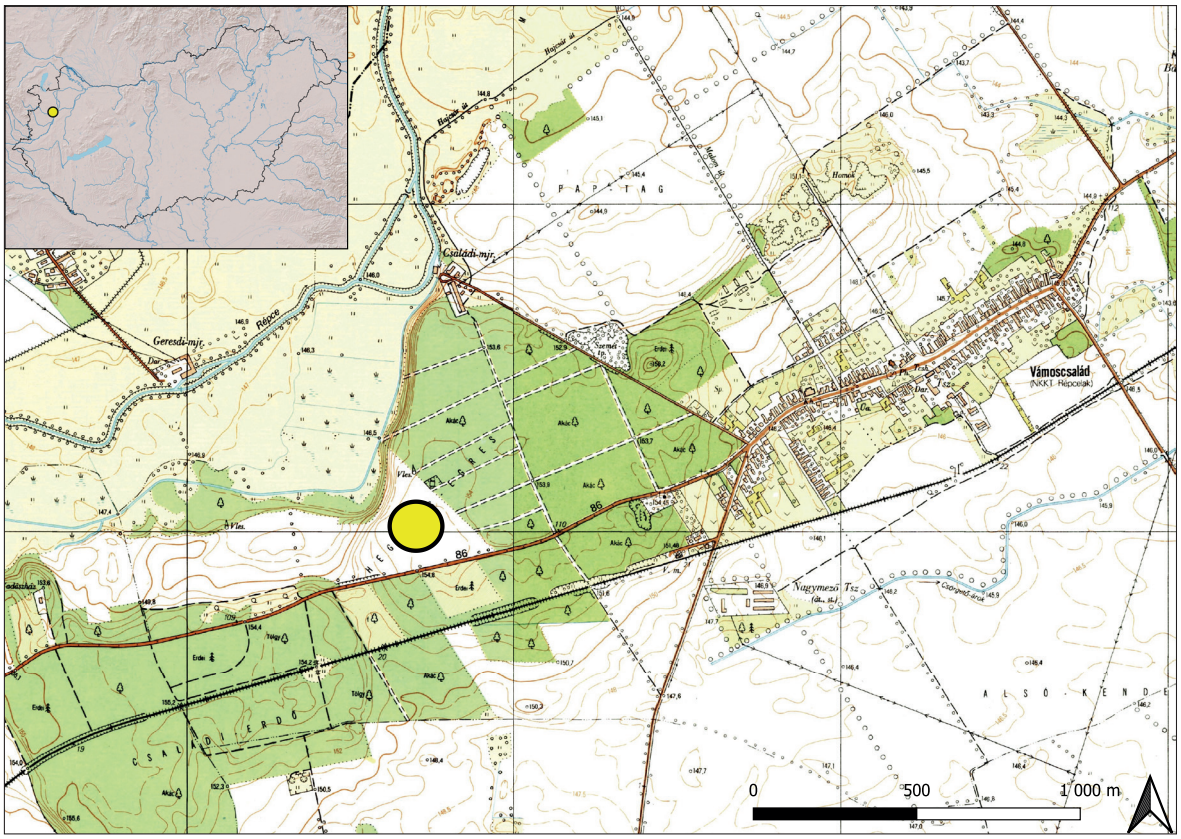

Fig. 1. Location of the Vámoscsalád-Kavicsbánya site (yellow circle) (CAD: N. Faragó)

sels, finds showing close similarity to the burial assemblages from Chernelházadamonya,[6] Répceszentgyörgy,[7] or the unpublished material of Gór-Kápolnadomb. The daub fragments could be from buildings from any of the periods mentioned above.

Knapped stones

The collection of knapped stone artefacts from Vámoscsalád-Kavicsbánya only contains surface finds. Keeping a presumed mixing of different archaeological periods in mind (as it is not possible to assign the finds to archaeological cultures on a techno-typological basis), the whole assemblage is treated as a single unit by necessity. Consequently, all percentages, technological and typological comments and conclusions are of limited validity and can be accepted only with reservations.

Raw material utilisation

The site yielded a total of 329 knapped stone artefacts. The distribution of technological categories by raw material is presented in Table 1. Three raw material types could be determined macroscopically, while it was not possible to identify the raw material of three finds. The dominance of radiolarite (RM1) from the Bakony region, about 70 km from the site, is overwhelming (93.01%). Almost all pieces are a shade of brown, ranging from light to dark (Hárskút-type). The reddish Szentgál-type is represented by two or three uncharacteristic specimens, while a core and nine fragments were made from blackish-yellow Úrkút–Eplény-type radiolarite. The proportion of corticated finds is quite high; the 43 artefacts account for 14.05% of the 306 radiolarite findings, including five cores,

6 Medgyes 1981.

7 Kiss – Szilasi 2002.

eighteen raw material fragments, seven flakes, and thirteen tools. Primary processing was most probably carried out partly at the geological source and partly at the archaeological site. Two cores, three flakes, twenty-three raw material fragments and eight tools in the collection show signs of a more or less intense heat effect, some even being fragmented and having cracked surfaces.

Altogether 11 finds (3.34%)—a flake core, six flakes and four tools—were made from Tevel flint (RM2), the geological source of which is located at a distance of about 45 km from the site. The presence of flakes suggests that the tools were made on-site. The core, one flake and two tools are also corticated. The surface of one flake shows heat marks.

The raw material of nine finds (2.74%), three tools and six flakes, is limnic silicite of unknown origin (hydro- or limnoquartzite; RM3). The colour range of the finds is quite varied, brownish-pink, pinkish, yellowish-brown, and greyish.

Technological remarks

In the following, we draw mainly on the publications of Marie-Louise Inizan and her colleagues for technological concepts.[8] The technological aspects of Neolithic artefact assemblages have been discussed in detail by Inna Mateiciucová.[9]

The lithic record of the site comprises 27 cores (8.21%) altogether; of these, twelve are bladelet cores, while fifteen, flake cores (Fig. 5; Fig. 6).

Only a few exhausted pieces (20–30 mm in diameter) have been found among the bladelet cores, while most are still suitable for lamellar removal. Unipolar cores with a single striking platform and debitage surface are typical, but small flake cores feature marks of irregular removal. We could observe traces of core preparation before each removal on bladelet cores

Fig. 2. Polished stone axe made from Felsőcsatár-type greenschist (Photo: A. Péntek)

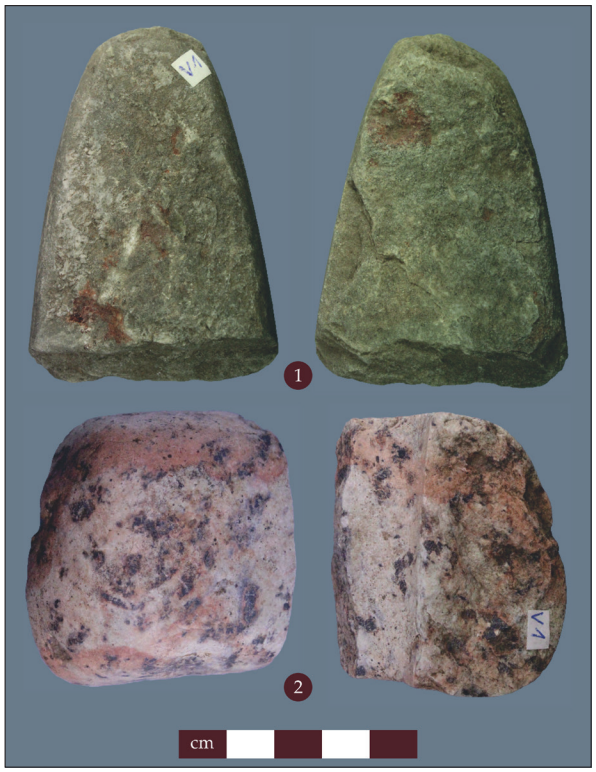

Fig. 3. 1 – Polished stone axe made from Felsőcsatár-type greenschist, 2 – fragment of a polished stone axe made from greenish serpentinite with dark grey and burgundy (claret) spots (Photo: A. Péntek)

8 Inizan et al. 1999.

9 Mateiciucová 2008, 65.

and some cores with negatives of long flakes, implying perhaps direct percussion with a soft hammer. In such cases, to ensure the success of removal, the core ridge must have been reinforced first by dorsal reduction and/or abrasion to remove overhangs. Traces of preparation could also be observed on blades/flakes. There is no crested blade among the artefacts that served as a primary guide during the knapping process. Both core rejuvenation flakes were used as blanks for an end- and a side-scraper.

The blade blanks, at least twice as long as wide, only comprise pieces with a width of up to 10 mm (Fig. 7). These will be referred to as bladelets. The number of unretouched bladelets is very low (11 pieces, 3.34%); only four were used as blanks for microlithic tools.

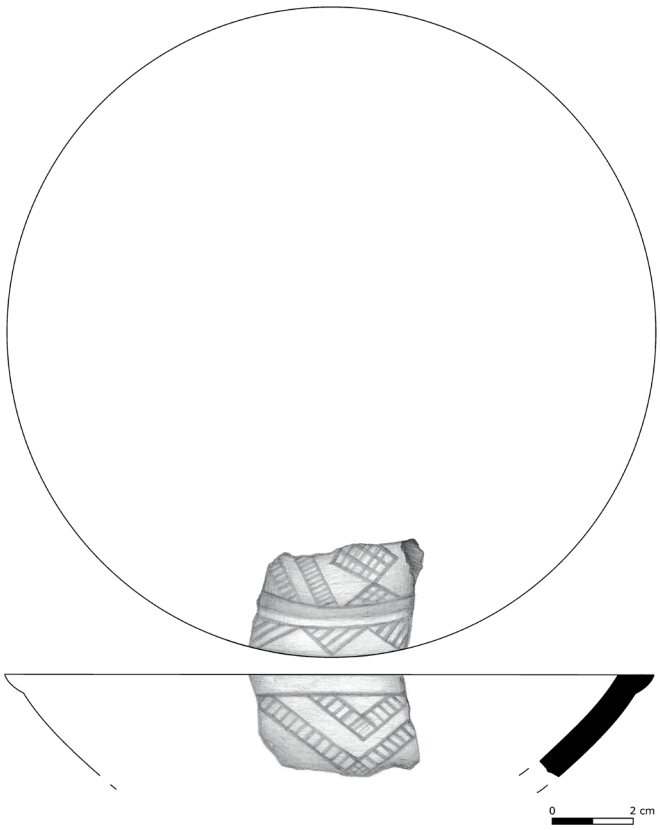

Fig. 4. Rim fragment of a dish with incised, encrusted decoration, Somogyvár–Vinkovci culture (Drawing: Á. Nagy)

So-called non-formal or unretouched tools include seven blades (six from Bakony-type radiolarite and a limnic silicite) and three bladelets (two from Bakony radiolarite and a limnic silicite). All pieces bear use-wear marks on one or both lateral edges, indicating more or less intensive use. However, none featured sickle gloss. Almost all have a regular (symmetrical) triangular cross-section, i.e., the main arris runs down the centre of the dorsal face. The lateral edges are, with a few exceptions, approximately parallel. In three cases, the morphological and debitage axis of the piece is different ('offset'), with the distal end tilted to the right or left. A deliberate break of one (or both) ends is common.

Tab. 1. Distribution of technological categories by raw material (RM1 – Bakony radiolarite, RM2 – Tevel flint, RM3 – limnic silicite, RM99 – Unknown)

Knapped stone/ Raw material	RM1	RM2	RM3	RM99	#	%
Tool	40	4	2		46	13.98
Bladelet core	12				12	3.65
Flake core	14	1			15	4.56
Blade (with use retouch)	6		1		7	2.13
Bladelet (Width<=10 mm; Length>=2*Width)	11				11	3.34
Bladelet (with use retouch)	2				2	0.61
Flake (Length>=12 mm)	59	6	4	3	72	21.88
Flake (Length<12 mm)	41		2		43	13.07
Raw material piece, debris	121				121	36.78
#	306	11	9	3	329	100.00
%	93.01	3.34	2.74	0.91	100.00	

Large flakes (with the largest dimension over 12 mm) do not include primary or decortication flakes or blanks. Practically all 72 fragments (21.88%) can be associated with core shaping. The number of small fragments (less than 12 mm; 43 pieces, 13.07%) is surprisingly high considering the conditions under which the finds were collected. Some of them are retouch flakes related to tool-making.

The butts of bladelets and flakes are often fragmentary, and some cannot be examined as they had been reworked (for hafting) or broken off deliberately. Pointed and linear butts are prevalent among the preserved pieces. The butts were recognisable on 11 tool blanks (flakes); two were corticated, five faceted, and six plain. No 'lip', a slight projection of the ridge formed by the butt and the lower face of the removed piece, generally indicative of soft-hammer direct percussion, was observed on any unretouched bladelet or flake. However, six tools featured a slight lip.

The proportion of raw material fragments among the finds is very high (121 pieces, 36.78%). Many pieces are large, without obvious impurities in the raw material, meaning they would be suitable for a core. As mentioned above, the number of corticated and, primarily, raw material fragments with thermal marks is quite high. Since the exact find spot cannot be identified, one can only conclude that they were deposited together as a raw material reserve ready to be processed.

Retouched tools

Altogether 46 retouched formal tools (13.98%) could be identified and described in the lithic collection. The distribution of tool types by raw material is presented in Table 2. Although the number of tools does not reach a hundred, quantities are given in the following as percentages for clarity. As for raw materials, Bakony radiolarite (40 pieces, 86.96%) is prevalent among tools, just like in the whole collection. Also, the proportions

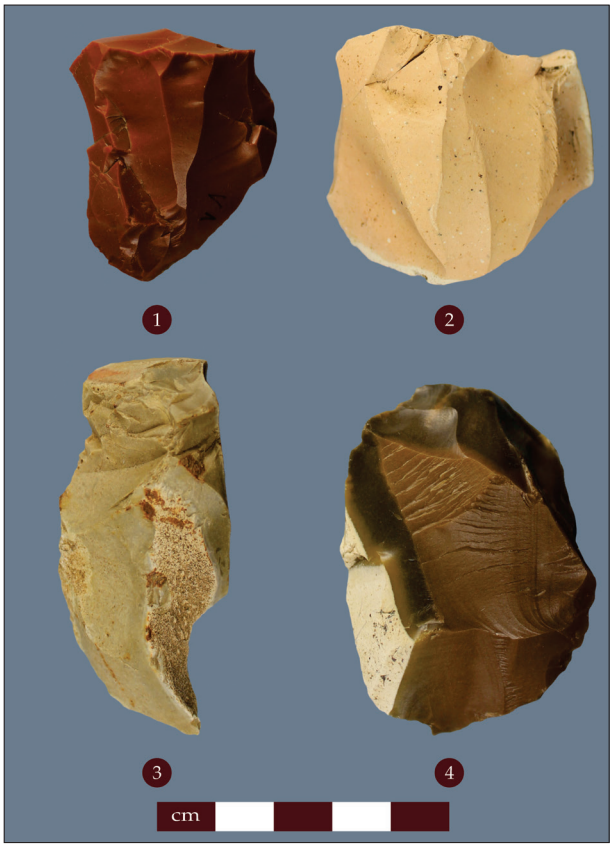

Fig. 5. 1–4 – Selection of cores (Photo: A. Péntek)

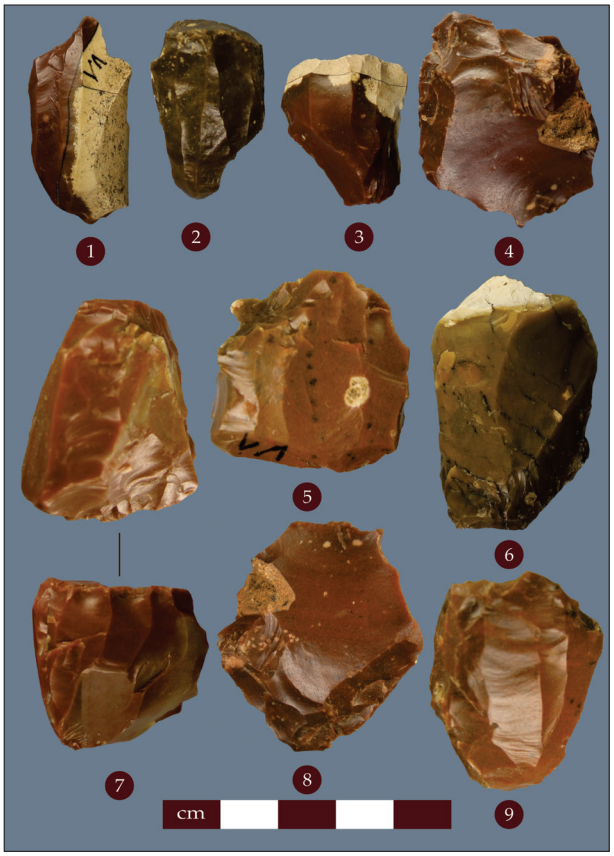

Fig. 6. 1–9 – Selection of cores (Photo: A. Péntek)

of Tevel flint and limnic silicite are similar to their occurrence in the whole assemblage (4 pieces, 8.7% and 2 pieces, 4.35%, respectively). All tools were made from bladelets, flakes or raw material fragments except for a single truncated blade.

The 12 end-scrapers (Fig. 8.1,3) represent over a quarter of the tools (26.09%), which makes them the most frequent type in the collection. All were made from Bakony radiolarite. Two of them are retouched flakes, with the end-scraper front partially extended to their lateral edges.

One (or both) of the lateral edges is usually retouched directly or inversely and/or is flanked by use. The tool blank can be a simple flake (6 pieces), core rejuvenation flake (1 piece), or fragment (2 pieces). The type of the blank could not be determined in three cases. Their morphometric data vary in a very wide range, i.e., they are rather heterogeneous in size. Length varies between 5.6 and 36.8 mm, with a mean of 24.67 mm and a

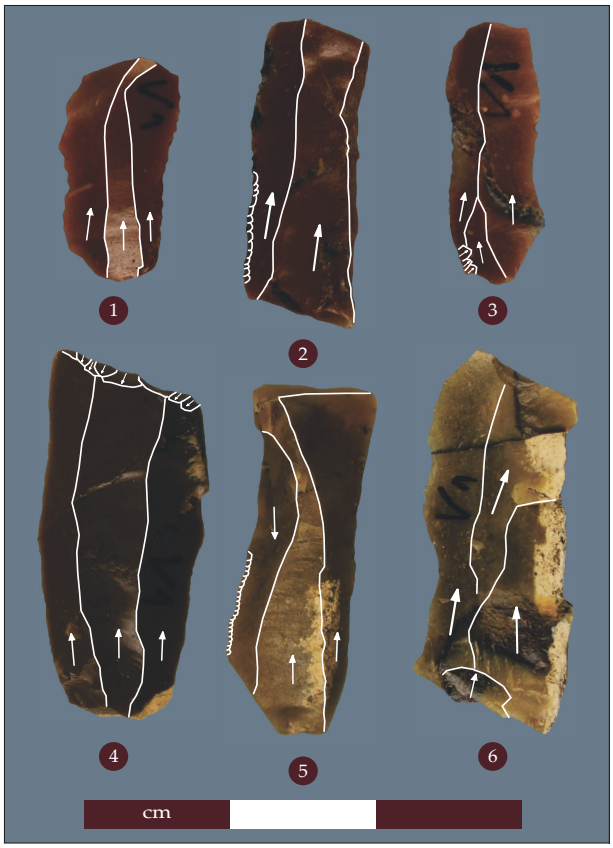

Fig. 7. 1–6 – Selection of blades (Photo: A. Péntek)

Tab. 2. Frequency of retouched tool types (RM1 – Bakony radiolarite, RM2 – Tevel flint, RM3 – limnic silicite, RM99 – Unknown)

Tool / Raw material	RM1	RM2	RM3	RM99	#	%
End-scraper	12				12	26.09
Burin	2				2	4.35
Laterally retouched blade	1				1	2.17
Truncated blade	1				1	2.17
Truncated bladelet	2				2	4.35
Laterally retouched bladelet	2				2	4.35
Notched bladelet	2				2	4.35
Retouched flake	4		2		6	13.04
Side-scraper		2			2	4.35
Atypical retouched piece	4				4	8.70
Splintered piece	6				6	13.04
Combination tool		1			1	2.17
Sickle insert	1				1	2.17
Segment	1	1			2	4.35
Trapeze	2				2	4.35
#	40	4	2		46	100.00
%	86.96	8.70	4.35		100	

standard deviation of 9.06 mm. Width varies between 11.4 and 27.4 mm, with a mean of 20.06 mm and a standard deviation of 5.04 mm. Thickness ranges from 3.6 to 17.0 mm, with a mean of 9.84 mm and a standard deviation of 3.91 mm.

The second largest tool group comprises six retouched flakes and six splintered pieces (13.04%; Fig. 8.7–8; Fig. 9.1,3,7). Four of the retouched pieces were made from Bakony radiolarite and two from limnic silicite. Again, the morphometric data vary over a wide range: length between 13.2 and 43.2 mm, width between 7.3 and 42.4 mm, and thickness between 2.3 and 16.5 mm. The average length is 25.9 mm, average width 19.88 mm, and average thickness 7.78 mm. Two specimens are retouched on both edges (bifacial retouch), and four have inverse retouch. Edge wear from use could be observed in all specimens, but only one had sickle gloss.

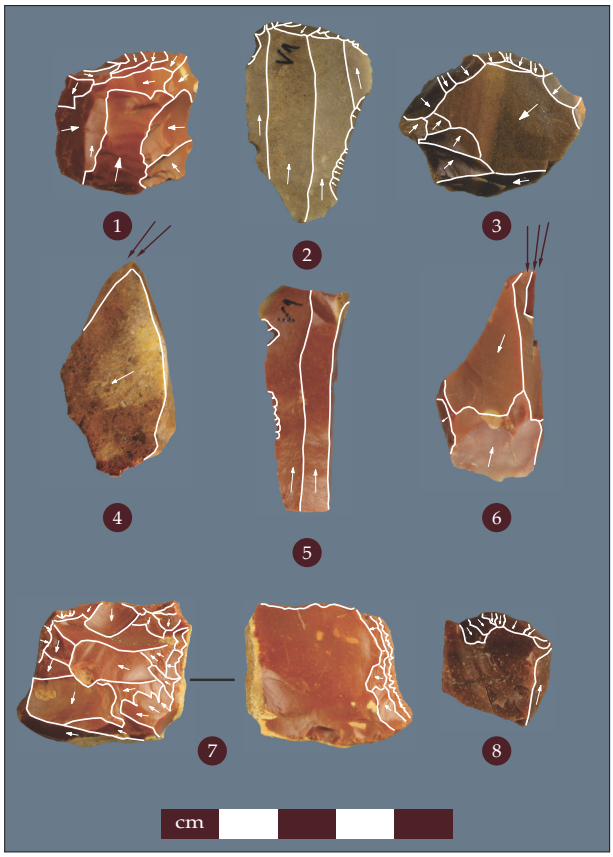

Fig. 8. 1, 3 – end-scraper, two combination tools (end-scraper + notch), 4, 6 – burin, 5 – retouched bladelet, 7 – splintered piece, 8 – retouched flake/end-scraper (Photo: A. Péntek)

The splintered pieces were made from Bakony radiolarite. They are smaller than the retouched flakes. They vary in length from 12.9 to 27.4 mm, width from 13.4 to 25.8 mm, and thickness from 4.2 to 10.0 mm. The average length (22.5 mm) and width (20.13 mm) are nearly identical. The average thickness is 6.73 mm. The straight distal end of the flakes is splintered on both faces in all cases, while one of the edges is elaborated similarly in three cases. All splintered edges feature use-wear marks.

Both trapezes are made from radiolarite bladelets with a regular triangular cross-section (Fig. 10.4–5). Their ends are asymmetrical with different angles. One trapeze has a splinter mark on its long edge and an irregular V-shaped break on the shorter edge at the base. Dimensions: 16.3×10.1×3.2 mm (Fig. 10.4). The lower left part of the other trapeze is slightly damaged (perhaps burnt), with a retouched notch at the upper end; the right end is slightly concave. The longer edge has an elongated indentation with different (use?) retouch on the rim, while the shorter edge has an inverted pearl retouch at the base. Dimensions: 11.0×8.8×1.9 mm (Fig. 10.5).

The first of the two segments (Fig. 10.2) is a small piece with an asymmetrical triangular cross-section (sharp wedge profile) made from a medium-brown Bakony radiolarite bladelet. The proximal end is broken (damaged?), and the right lateral edge is slightly curved and backed. The segment, of 13.5×5.1×3.2 mm, is heavily burnt.

The other segment has a slightly asymmetrical triangular profile (the main arris is tilted to the right lateral edge): It was made from a grey-green Tevel flint bladelet (Fig. 10.1), with a slightly curved back at both ends; the backed terminal edges lean onto the pearl-retouched left lateral edge to form a uniform curved left lateral edge. The straight edge shows a slight trace of use retouch. Dimensions: 23.4×7.8×2.4 mm.

Other tools include burins (Fig. 8.4,6), both created from radiolarite fragments), retouched (truncated, retouched, and notched) bladelets and retouched pieces (tool fragments) which are difficult to identify.

The collection also includes a medium-sized (34.5×22.5×4.3 mm) multifunctional combination tool made from Tevel flint. Its distal end has a steep end-scraper in front of a slightly curved line. There is a retouched notch near the distal end on the left lateral edge, with use-related flanks along the edge. The proximal end of the right lateral edge has a 19 mm-long retouch (Fig. 8.2).

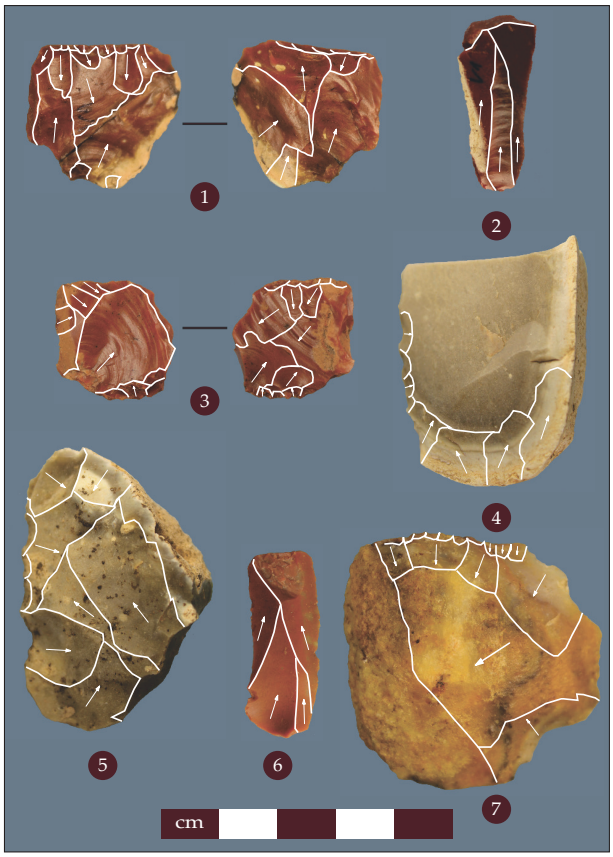

Fig. 9. 1, 3 – splintered piece, 2, 6 – retouched bladelet, 4–5 – side-scraper, 7 – retouched flake (Photo: A. Péntek)

Two Tevel flint side-scrapers (Fig. 9.4–5) shall also be mentioned here. They differ from the retouched flakes typologically; both resemble Palaeolithic natural-back side-scrapers. One (Fig. 9.4) is made from a thick flake or raw material fragment. The presumed distal end broke off (perhaps intentionally). It is slightly retouched, with curved lines on the "left" lateral edge, and features cortex residue on the high 'right' lateral edge (natural back) and the curved base. Dimensions: 39.4×31.8×13.8 mm. The other piece (Fig. 9.5) was refined from a core rejuvenation flake by reworking the proximal end and transforming the butt and the bulb. It has a concave-triangular profile. The straight left lateral edge is obliquely retouched; the thick, ridged right lateral edge is a natural back with cortex residue at the distal end. Dimensions: 46.2×31.4×15.1 mm.

Possible cultural analogies of the artefacts

Known archaeological sites and remains in the region

The Répce (Rábca/Rabnitz) Valley[10] in the eastern foothills of the Austrian Alps is one of the best-researched areas in Western Transdanubia today, but also one of the key regions due to the connection network of the Rába and Danube rivers and the Devín Gate (Dévény-kapu). The current paper, however, only focuses on the small section of the Répce River adjacent to the site.

The most important site upstream (towards the Alpine area in the west) is undoubtedly Gór-Kápolnadomb. Its record includes several historical periods, starting with the Middle Neolithic TLPC (the excavated finds and phenomena of which still await publication) and the Late Neolithic Lengyel Culture (that is available already).[11] A community of the Gáta–Wieselburg Culture also settled there, just like on other river terraces (e.g., Csepreg and Szakony).[12] The bronzeworking and some (radio-

10 Ilon 2018.

11 Tóth 2006.

12 Károlyi 1975; Ilon 1996a.

carbon-dated) 'irregular' pit burials of the Late Bronze Age Urnfield Culture,[13] as well as the prestige pottery of the Hallstatt Culture[14] have been known by the international academic community for decades. Besides, the site's record also comprised finds that are rare in the Carpathian Basin: a Celtic pottery deposit (unpublished) and a pottery kiln; together with the unique radiocarbon data series of the settlement's earthworks, they represent a valuable source for research.[15] Furthermore, there is a small Árpádian Age palisade fortress, protected by a ditch, in the close area.[16] Hegyfalu lies near Vámoscsalád; several well-excavated sites are known in its territory, including relics like an early Tumulus Culture house fragment under the former cowshed opposite the present-day ÖMV petrol station, the Hallstatt Period cemetery, and the houses of an Árpádian Age village unearthed as part of the excavation preceding the construction of the petrol station. Just a few hundred metres away, a Celtic cemetery complex was found in the path of the then-future M86 motorway.[17]

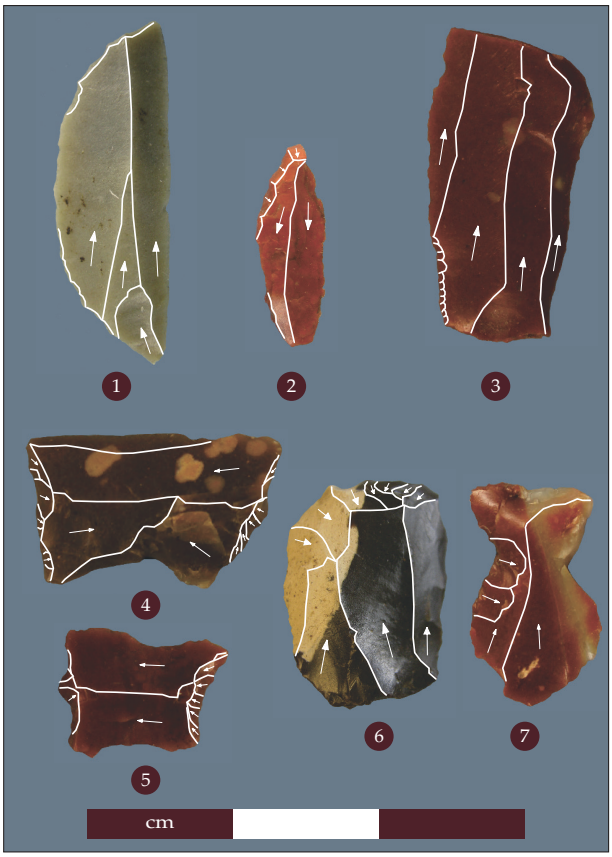

Fig. 10. 1–2 – segment, 3 – retouched bladelet, 4–5 – trapeze, 6 – end-scraper, 7 – notched bladelet

Noteworthy sites can also be found downstream of our site, including the burial of a Germanic woman from the second half of the 5th century AD in the territory of today's Répcelak[18] and the sites around Ménfőcsanak, an area that seemingly played a significant role in several historical periods.[19]

Possible analogies of the knapped stone material

Raw material

The knapped stones appearing in Neolithic sites in Northern Transdanubia are predominantly made from radiolarites from the Transdanubian Mountains.[20] Although several scientific investigations have been carried out in the last decade to identify and more precisely localise the raw material sources in the area concerned,[21] currently, the Bakony variants (Szentgál, Úrkút, Hárskút) that

13 Ilon 1996b; Ilon 2001.

14 Ilon 2008.

15 Ilon 1998a; Ilon 1998b.

16 Dénes 1990.

17 Molnár 2006; Hornok – Tóth 2016.

18 Straub 2006.

19 Egry 2004; Vaday 2006; Tankó 2010; Ilon 2017 with further literature.

20 Biró – Regenye 1991, 365; Biró 1998, 50, 78; Faragó – Ilon 2015.

21 Biró et al 2010; Szilasi 2017.

appear in the archaeological literature cannot be distinguished from each other either geochemically or regionally. In addition, the outcrops seem to follow the line of the Middle Jurassic limestone formations, with raw material fragments suitable for knapping scattering over a vast area as debris on or near the surface.[22]

The Tevel flint is one of the most specific raw materials in Hungary: although it can be regarded as flint (a Cretaceous shallow marine formation) in the narrow sense and has excellent flaking properties,[23] its distribution is very limited. During the TLPC (more precisely, in the Late Middle to Early Late Neolithic), its distribution area did not extend beyond 60–70 km from the primary geological source.[24]

The Cserhát Mountains is a limnic silicite source in Hungary; however, it does not yield material in the shades of the Vámoscsalád artefacts.[25] Geyserite, hydro- and limnoquartzite sources are known in the western and southern parts of the Mátra Mountains.[26] Suitable material in the shades of the Vámoscsalád artefacts occurs in the Gyöngyöstarján region (near Gyöngyösoroszi, Gyöngyöspata, and Gyöngyössolymos), but the distance between these sources and the site is about 210–220 km. Other limnic silicite sources in Northern Hungary (i.e., in the Bükkalja and Tokaj mountain ranges) also yield flint in shades that match the finds from Vámoscsalád but, as these sources are located in a distance of 300–400 km, a connection is unlikely and, therefore, will not be discussed here in detail.[27]

Hydroquartzite outcrops are known in the area of Central Slovakia, in the Žiar Basin, around the villages of Lutila, Slaská and Stará Kremnička.[28] The distance between these primary geological sources and the site is about 200 km, while the secondary sources near the lower course of the Garam River are about 140 km away. The most common colour variations are white, greyish-black and black.

One possible source outside these areas is in Burgenland, where intensive research over the last decade has identified a limnic silicite source near Csaterberg and Kohfidisch.[29] Geological research drew attention to the presence of "geysers" in the region as early as the 1920s, and the history of the related Pannonian geological formations has also been investigated since the 1950s.[30] However, the archaeological significance of this discovery has only increased in recent years, as there is growing and ever-increasing evidence of that this area and its raw material were actively used in prehistory from the Middle Palaeolithic to the Copper Age.[31] This raw material source is located at a distance of only 50–60 km from Vámoscsalád and yields opalites and opalised flint in shades of brown, yellow, and white.

So far, there is very little data on limnic silicite use in North-western Transdanubia in context with stone knapping. The presence of raw materials coming from there in a larger quantity is probable

22 Szilasi 2017, 259–261.

23 Biró 2003c; Biró et al. 2010.

24 Biró 1998, 47; Biró 2007, 65, Faragó – Ilon 2015.

25 Markó 2005.

26 Varga et al. 1975; Dávid 1997; Pelikán 2010; Zelenka 2010; Mester – Faragó 2022.

27 Mester – Faragó 2016.

28 Kaminská 2001, 84; Kaminská 2013, 100.

29 Szilasi 2019a.

30 Kümmel 1957.

31 Schmitsberger et al. 2021; Schmid et al. 2021.

from the first phase of the Lengyel Culture[32] and, based on the record of Szombathely-Oladi plató, where all phases of the *chaîne opératoire* of knapped tool-making were present, tools were probably made on-site. The artefacts from Bucsu-Rétmellék dűlő also support this reconstruction: only four opalite pieces were found there, one of which was a core.[33] Some hydroquartzite finds of unknown origin are known in the stone record of Sorkikápolna-Dombi-dűlő (Kavicsbánya).[34] However, as the lithic material includes finds of the TLP and Lengyel cultures, the hydroquartzite findings cannot be dated precisely. The lithic record of Torony-Nagyrét lakópark, with opal raw material chunks from Baden and Furchenstich features, provides evidence of Copper Age use.[35]

Inna Mateiciucová studied raw material use in the Neolithic in Lower Austria, corresponding to diverse horizons of the Linear Pottery Culture (LPC). She mentions a single burnt limnic silicite find from Brunn I (Brunn am Gebirge; LPC phase I/II [earliest/earlier]) and identifies the areas of Central Slovakia and Northern Hungary, 170 km and 270–280 km away from the site, respectively, as possible geological sources.[36] Mold I also represents an early LPC phase. Its record contained a single stone artefact of SWPS (siliceous weathering products of serpentinites) or limnic silicite.[37]

The LPC II (early LPC) site of Těšetice-Kyjovice-Sutny in Southern Moravia contains a single, uncertain limnic silicite artefact, the material of which, according to Mateicuciová, had might come from Central Slovakia 180–190 km away.[38] The lithic record of Žopy-Cihelna in Southern Moravia, an LPC I (earliest) site, contains three uncertain limnic silicite artefacts at a distance of 130 km from the geological source of their raw material.[39]

Technology

As more than 90 per cent (93.01%) of the knapped lithic finds were made of radiolarite, the homogeneity of the raw material spectrum allows us to discuss the different technological categories together. Detailed evaluations, including a description of the technological spectrum, of several knapped stone assemblages from the county—mainly from the *Notenkopf* and Zseliz periods—are available in literature. They all show the same homogeneity, which allowed us to make a direct comparison of technological categories.[40] The 27 cores represent 8.21% of the assemblage, which is high compared to Répcelak, Szeleste, Torony and Bucsu (with the Torony assemblage standing out with only 6.3%). The proportion of unretouched flakes and waste is also remarkably high: the 236 pieces represent 71.73%. The closest figure is for Bucsu, where the proportion of unretouched flakes is almost 60%. The proportion of unretouched blades and bladelets is particularly low; while in other assemblages, their proportion may reach over 30%, in Vámoscsalád, it is only 6.08%. The proportion of retouched tools is also low (13.98%) in Vámoscsalád, while in Répcelak, Szeleste and Torony, this number is close to or even above 20%. Finally, it is worth comparing the proportion of pieces containing cortex parts: their proportion in Vámoscsalád is 17%, compared to 11–12% in other sites in the county.

32 Szilasi 2019a; Szilasi 2019b.

33 Faragó 2010.

34 Nagy 2016.

35 Faragó 2010.

36 Mateicicuvá 2008, 197, Tab. 57.

37 Mateiciucová 2008, 202, Tab. 68.

38 Mateiciucová 2008, 2,41, Tab. 224.

39 Mateiciucová 2008, 263, Tab. 289.

40 Faragó – Ilon 2015, Fig. 7.

Technological details are available of the knapped stone findings of Szombathely-Oladi plató (County Vas),[41] and the site provides an exceptional opportunity to compare the lithic industries of the TLP and Lengyel cultures. As for the TLPC horizon of the settlement, only the blade–flake ratio is known, which is very similar to our site: 71% of the debitage are flakes and only 29% blades (the proportions in Vámoscsalád are 86% and 14%, respectively).

Technological data are also available from several LPC sites, including Mencshely-Murvagödrök,[42] Štúrovo/Párkány,[43] Bicske-Galagonyás,[44] Brunn I, IIa, IIb,[45] and Szentgyörgyvölgy-Pityerdomb.[46] It is worth highlighting the finds from Brunn I: the lithic record of the site comprises 15.2% cores, 61.9% unretouched flakes, 2.9% unretouched blades, and 20% retouched tools, a distribution closely similar to Vámoscsalád, even if the proportion of retouched tools is somewhat higher in Brunn. The proportion of unretouched blades (15.6%) and cores (7%) is also low at Szentgyörgyvölgy-Pityerdomb, while that of unretouched flakes (53.9%) and tools (16%) is relatively high.

The distribution of the different technological categories and their role in the lithic raw material procurement system has been discussed by several authors in the last decades.[47] Generally speaking, the closer a site or an assemblage lies to the raw material source, the higher the proportion of flakes to blades. Conversely, as one moves away from the geological source, the proportion of unretouched blades and tools increases in the assemblages, while that of the flakes (associated with stone tool-making) decreases. When evaluating Middle Neolithic trends on a historical scale, a shift outlines. While early LPC settlements' records (even of the ones at a relatively great distance from the geological source of the lithic raw material) include a higher proportion of flakes and cores, suggesting intensive domestic-level on-site stone tool-making (secondary production settlements),[48] those of the following late classical and late periods reflect the emergence of a more intensive contact network and division of labour, including a system comprising primary production settlements (near exploited raw material reserves, with more blades than tools and 10% or fewer tools in the lithic record) and user settlements (farther from the source, characterised by assemblages with fewer flakes and more cores and more effective use of cores) where most blades and tools arrived ready-to-use.

In summary, the lithic record of Vámoscsalád is an example of a blade industry akin to Oladi-plató and all TLPC sites, with matching technological characteristics. It contains blade-bladelet cores with one striking platform and debitage surface and irregular, weathered flake cores. The quantity and quality of the core preparation, the preparation of the butts and the development of the striking angles also have similar characteristics, all suggesting an indirect percussion technique, with some minor indication of direct percussion with a soft hammer. However, the distribution of technological categories separates the Vámoscsalád assemblage from the analogies.

41 Szilasi 2019b.

42 Biró 1992.

43 Kaczanowska 1994.

44 Starnini 1996.

45 Mateiciucová 2002.

46 Biró 2005.

47 Lech 2003; Kaczanowska – Kozłowski 2008; Mateiciucová 2008.

48 Mateiciucová 2008, 102.

Typology – Splintered pieces

A splintered piece *(pièce esquillée)* is a rectangular tool, often with two opposite, rarely with one or all four splintered ends, sometimes on both faces.[49] Birgit Gehlen highlights the use of the bipolar, i.e., opposing removal technique *(ausgesplitterte Stücke)* in context of splintered tools in her study about Mesolithic tools in Central Europe.[50] She concludes that they are rare in the Mesolithic and are usually small pieces.

Inna Mateiciucová focused in more detail on Neolithic splintered pieces. Based on the original definition of the tool, she also skimmed the question of their function,[51] on which there are different opinions (tool or core—especially in light of the bipolar removal technique). She noted that splintered pieces are often found in areas where raw material is scarce or available as small pebbles. The occurrence of splintered pieces is well-documented in both the early and late LPC. Her study only comprises the early TLPC Szentgyörgyvölgy-Pityerdomb from Hungary.[52]

Splintered pieces also occur in TLPC sites in Vas County.[53] The lithic record of Szeleste-Szentkúti-dűlő comprises 312 knapped stones, with nine splintered pieces among them.[54] In our opinion, despite the lack of strict typological criteria, the pieces from Vámoscsalád-Kavicsbánya are correctly described as splintered pieces.

Typology – trapezes

Wolfgang Taute analysed the technique of making Late Mesolithic and Early Neolithic microliths.[55] While the so-called *Kerb-Schlag (microburin)* technique was used during the Late Mesolithic, the *Bruch-Technik* or *Kerb-Bruch-Technik* is typical of the Early Neolithic. *Microburin* finds, which are the *index fossile* of the *Kerb-Schlag* technique, were not found at Vámoscsalád-Kavicsbánya (nor were any obliquely broken blades/bladelets), but the lithic record of the site contained four microliths, two trapezes, and two segments.

Several slight differences can be detected between the two trapezes in size, morphology and workmanship (Fig. 7.4–5). While the left end of the second trapeze suggests the *Kerb-Bruch* technique, thus having a Neolithic character, no such traits can be observed on the first piece. Therefore, we briefly discuss the occurrence of trapezoids in the Mesolithic in the following; their occurrence in the Neolithic, even if only in a domestic context, is beyond the scope of this article and only few examples mentioned.

Most recently, Inna Mateiciucová evaluated trapezes and trapezoidal forms, mainly from the Late Mesolithic and the Early Neolithic, in more detail.[56] Due to the wide range of finds, the sites east of the Danube River are not considered here. Trapezoidal artefacts occur in Kaposhomok in Transdanubia.[57] Tibor Marton interpreted the site as part of the Late Mesolithic "trapezoidal" cultural area, containing elements of Western techno-complexes.

49 Demars – Laurent 1989, 94, Fig. 33; Le Brun-Ricalens 2006, 99, Fig. 1.

50 Gehlen 2012, 595.

51 Mateiciucová 2008, 178–179.

52 Bánffy 2004; Biró 2001; Biró 2002a; Biró 2005; Mateiciucová 2008, 96.

53 Faragó 2010; Faragó – Ilon 2015.

54 Faragó – Ilon 2015, 97.

55 Taute 1974.

56 Mateiciucová 2008, 91–95.

57 Dobosi 1972, Abb. 2,35–38; Marton 2003, 40, 47 1. kép 1–3.

Based on the work of Walter Leitner[58] and Walpurga Antl-Weiser,[59] Mateiciucová mentions trapezes from Lower Austria from Wien-Bisamberg, Burgschleinitz bei Eggenburg, and Horn-Mühlfeld.[60] The lithic record of Wien-Bisamberg contains a mixture of finds from the Mesolithic and different phases of the Neolithic. Mesolithic finds (based on typological traits) contain triangles *(langschmale Dreiecke)*, curved points/segments *(Bogenspitze/Kreissegmente)* and wide trapezes *(breite Trapeze)*.[61] For more comprehensive information on Lower Austrian sites, see Beatrix Nutz's MA thesis.[62] In Western Slovakia, trapezes are present in the Late Mesolithic sites Sered'-Mačanské-vŕšky and Dolná Streda-Vŕšky.[63] The cultural assigning of the latter is problematic due to the presence of Lengyel-style pottery.

Trapezes are rare finds in the discussed TLPC sites in Vas County. A single trapezoid occurs at Szeleste-Szentkúti-dűlő[64] and Torony-Nagyrét;[65] furthermore, two trapezes have been recovered from TLPC[66] and one from Lengyel context[67] in Bucsu-Rétmellék-dűlő.

Typology – segments

By general definition, a segment is a circular sector-shaped microlithic tool. For obvious practical considerations, most were made by giving the steeper lateral edge of the blanks with a mainly asymmetrical cross-section a curved shape.[68]

In the case of backed blade(s) and geometric microliths (except for trapezes), the backed edge was used to insert the tool into a complex tool ("lithic insert"), i.e., that is the so-called "passive" edge of the tool. The opposite, retouched or unretouched, edge was the "active" or "working" edge.[69]

It is a question of whether the two segments from Vámoscsalád-Kavicsbánya, substantially different in raw material, size, shape, and workmanship, belong to the same cultural unit or even the same archaeological period. Morphological analogies to the small, perhaps more atypical segment can be found in Sered'-Mačanské-vŕšky in Slovakia.[70] The larger specimen of the two was created by backing the less steep lateral edge and combining it with the truncated end by subtle retouching. A possible explanation for this design, unknown in Mesolithic times, could be that the tool was not intended to be truncated by continuous blunting or truncation. The elaboration of a broad segment from Brunn IIa (Lower Austria) somewhat resembles similar type finds in the records of Szentgyörgyvölgy-Pityerdomb and Vámoscsalád-Kavicsbánya.[71]

Segments first appeared in Central Europe in the Early Mesolithic. They seem absent from South- and Southwest-Central Europe during the Late Mesolithic, their function being taken over by trapezes. In contrast, they were present in Southeast-Central Europe at the time.

58 Leitner 1984.
59 Antl-Weiser 1986.
60 Mateiciucová 2008, 42–43.
61 Gulder 1953, 23–25.
62 Nutz 2006.
63 Bárta 1957; Bárta 1959; Bárta 1972; Bárta 1981.
64 Faragó 2010, 30, 4. táblázat.
65 Faragó 2010, 36, 6. táblázat.
66 Faragó 2010, 51, 13. táblázat.
67 Faragó 2010, 55, 15. táblázat.
68 Barrière et al. 1969, 361, Fig. 5,95–124.
69 Taylor 2012; Pyżewicz 2015, 525, Fig. 4,2.
70 Bárta 1972, 65, Fig. 5,36–55.
71 Mateiciucová 2008, 95, 299, Fig. 11,11.

Segments have only been recovered from Kamegg in Lower Austria[72] and Dolná Streda-Vŕšky[73] and Sered'-Mačanské-vŕšky[74] (together with trapezes) in Western Slovakia. Segments (both wide and narrow) without trapezes have also been found in Tomášikovo.[75] Besides, Inna Mateiciucová,[76] after Bohuslav Klíma drew attention to Šakvice (Moravia) with four symmetrical segments in its lithic record, three of which are bifacially retouched with semi-abrupt retouch. Segments in Hungary are known from Szekszárd-Palánk,[77] while a microlithic tool recovered from Páli-Dombok, identified as a typologically Late Palaeolithic/Early Mesolithic backed point, only resembles them.[78] Furthermore, a segment was found in Regöly 2 (Transdanubia).[79]

Mateiciucová mentions a broad segment from the earliest LPC site Brunn Ib and another fragment from Brunn Ia.[80] A broad segment was also discovered in Neckenmarkt.[81] All three segments were made from Szentgál radiolarite. Segments are known from Early Neolithic (Starčevo) context from Gellénháza-Városrét[82] and Vörs-Máriasszonysziget.[83] The segment reported from the latter site is rather large (41×17×11 mm) and cannot be considered a geometric microlith. The illustration shows that the less steep lateral edge of the piece is not backed but semi-abruptly retouched. Segments have also been found in the early TLPC site Szentgyörgyvölgy-Pityerdomb.[84] Segments in these Neolithic sites might testify to the continuation of Mesolithic and Pre-Neolithic traditions. According to Tibor Marton, trapezes and segments are less common in the Early Lengyel and more common in the Late Lengyel culture.[85] The record of the Late Neolithic (Lengyel III) Szentgál-Füzikút comprises an 'insert' with an intense sickle gloss at the distal end (tip).[86] Besides, the broad segment found at Zirc-Király stream, made from a Szentgál type radiolarite blade with semi-abrupt retouch, and showing sickle gloss, could also have functioned as an insert.[87]

Typology – burins

Unlike other tools, burins are relatively scarce on LPC sites; however, the two pieces from Vámoscsalád may also serve as a chronological reference. No burin was found at any *Notenkopf* or Zseliz site in Vas County,[88] unlike Štúrovo/Parkány in Slovakia, north of the Danube.[89] In contrast, the Early Neolithic Starčevo assemblages, including Zalaegerszeg-Gébárti tó, Gellénháza-Városrét, and

72 Nutz 2006, 31, 61, 62, Taf. 12,217,218.
73 Bárta 1972, 70, Fig. 9,11–12.
74 Bárta 1972, 65, Fig. 5,36–55.
75 Bárta 1972, 68, Fig. 8,2, 4.
76 Mateiciucová 2008, 96; Klíma 1953.
77 Vértes 1962, 176, Taf. 5,7–8.
78 Mester et al. 2015a, 123, Fig. 7: 3.
79 Eichmann et al. 2010, Fig. 3,7.
80 Mateiciucová 2002; Mateiciucová 2008, 95.
81 Gronenborn 1997, Taf. 1,2.1.
82 Biró 2002a, 159, Tab. 10.
83 Kalicz et al. 1998, 178, Fig. 13,1; Biró 2002a, 159, Tab. 10.
84 Biró 2002a, 159, Tab. 10; Biró 2005, 244.
85 Marton 2002, 330.
86 Biró 1994, 105, 14. ábra 5–6.
87 Regenye 2000, 19, 5. ábra 4.
88 Faragó 2010, 64, 28. ábra; Faragó – Ilon 20156, 103, 12. ábra.
89 Kaczanowska 1994.

Vörs-Máriaasszonysziget all contained burins,[90] which were particularly common in Gellénháza, making up more than 20% of retouched tools. As for the earliest TLPC, burins appear in Mencshely-Murvagödrök,[91] three pieces in the small Balatonalmádi-Vörösberény[92] assemblage, while the type represents 18% of tools in Szentgyörgyvölgy-Pityerdomb.[93]

Beyond our borders, burins are also known from Brunn IIa, Brunn IIb and Vedrovice-"Za dvorem".[94] Inna Mateiciucová considered it important to distinguish transverse burins from other burin types. The former is formed from the distal or proximal ends of blade fragments and should not be confused with burins created using the *microburin* technique (microburins do not feature the characteristic notch). In her opinion, most burins observed in this period are of this transverse design, but other forms are not at all common, and in this sense, she is sceptical about the typological classification of Starčevo and early LPC pieces from Hungary. The burins from Vámoscsalád do not belong to this transverse burin typological group; they were shaped from an irregular flake and a raw material fragment and have an *ad hoc* character.

Burins were not very common in the Mesolithic either; for example, no transverse or other burins are known from Regöly, Kaposhomok, or Páli.[95] From a broader perspective, the same holds for Central Europe (except for a few outliers).[96]

Conclusions

As all stones from Vámoscsalád-Kavics-bánya are uncontexted surface finds and the site's lithic record comprises pieces from diverse cultural units, we primarily looked for possible analogies and cultural connections based on similarities in raw material, technological and typological traits.

Although the pottery fragments of the TLPC recovered from the site are few and uncharacteristic, and the recovered finds may represent more than one phase, the knapped stone assemblage most likely represents the industry of that Middle Neolithic cultural unit, as suggested by raw material composition, technological features, type distribution, and characteristics of the retouched tools. It is perhaps even possible that we are dealing with relatively old, if not the oldest TLPC finds ever unearthed in the county, as indicated by the high proportion of cores and unretouched flakes representing types different from those of the late TLPC and the presence of segments and burins, which are completely missing from the late TLPC. We know of several sites representing the earliest periods of the culture from Zala County, the Balaton uplands[97] and even Lower Austria and Moravia,[98] that is, a vast area. Therefore, finding such a site in Vas County, a natural link between these regions, would not be surprising. Generally speaking, little is known about the chronology, development and spread of the TLPC in Western Transdanubia[99] as currently, only a cadastral-level

90 Biró 2002a, 159, 10. tábla; Biró 2003b, 123.

91 Biró 1992.

92 Biró 2001, Fig. 1.

93 Biró 2005, 244, Tab. 3; Mateiciucová 2008, 87.

94 Mateiciucová 2008, 87.

95 Marton 2003; Eichmann et al. 2012; Mester et al. 2015a; Mester et al. 2015b.

96 Mateiciucová 2008, 87; Gehlen 2012, 585.

97 Oross – Bánffy 2009; Oross et al. 2020.

98 Mateiciucová 2008.

99 Oross et al. 2020, 156, Fig. 1.

register of the sites of the period is available[100] and the processing and evaluation of the related finds has been occasional, carried out mainly for exhibition catalogues.[101]

In conclusion, the questions raised by the site's record cannot be answered only by analysing the (surface) finds. Nevertheless, the evaluation of the knapped stone artefacts led to a significant result—the location of an early TLPC settlement—and it can also be a good starting point for further research on the site.

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100 Ilon 2013.

101 Ilon 2007; Farkas 2011.

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